NISTTech

Highly Sensitive Oxygen Sensor for Cell Culture

Description

In situ measurements of oxygen partial pressure during cell culture reveal significant drops in local oxygen pressure, especially for high cell densities. Further, long time cultures reveal dynamic changes in oxygen as cells proliferate. The invention is non- invasive sensor for accurately monitoring *in vitro,* oxygen levels in cell cultures in real time. The sensor is based on the oxygen-dependent quenching of the materials comprising the three-layer sensor.

Applications

- • The improved oxygen sensor is likely to enable new studies on the effects of dissolved oxygen on cellular behavior by measuring and controlling local oxygen levels in the cellular microenvironment

Advantages

- • Allows easy integration of oxygen measurements with both phase contrast and fluorescence microscopy
- • Eliminates cytotoxic behavior and minimizes photo bleaching while providing a substrate for cell attachment
- • Prevents dye leakage while providing high sensor sensitivity

Abstract

An oxygen sensor comprising an oxygen sensing compound and configured to substantially mitigate leaching of the oxygen sensing compound from the oxygen sensor to an outer surface thereof is provided. The oxygen sensor may comprise one or more layers. A first portion of the oxygen sensor is configured to be permeable to gas and comprises an oxygen sensing material. A second portion is disposed with or on the first portion and is configured to be permeable to gas and substantially impermeable to the oxygen sensing material.

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Citations

1. P. C. Thomas, M. Halter, A. Tona, S. R. Raghavan, A. L. Plant, and S. P. Forry, A Noninvasive Thin Film Sensor for Monitoring Oxygen Tension during in Vitro Cell Culture, Anal. Chem. **81** (22), 9239–9246 (2009).

References

- U.S. Patent Application #
- Docket: 09-036

Status of Availability

This invention is available for licensing.

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